UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,584	02/28/2002	Ron P. Maurer	100202761-1	3918

7590 06/17/2004

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
SUKHAPHADHANA, CHRISTOPHER T	
ART UNIT	**PAPER NUMBER**
2625	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/087,584	Applicant(s) MAURER ET AL.	
	Examiner Christopher T. Sukhaphadhana	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8 and 14-20* is/are pending in the application.

4a) Of the above claim(s) *9-12 and 21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8 and 14-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Amendment filed 05 April 2004 has been entered in full.

2. Based on Applicant's amendments, the objections to the specification are withdrawn.

Oath/Declaration

3. The request to hold the objection to the declaration (paragraph 1, Office Action filed 03 December 2003) in abeyance until allowability of at least one of the claims is indicated is granted. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required once allowability of at least one of the claims is indicated.

Drawings

4. The drawings were received on 05 April 2004. These drawings are unacceptable.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "24" and "28" have both been used to designate a **data storage module** in Fig 2A (as amended) and paragraphs 0030, 0032 (as amended), and 0033. Also, the references characters "24" and "28" have both been used to designate a **user selection module** in Fig 2B (as amended) and paragraphs 0030, 0032 (as amended), and 0033. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Election/Restrictions

6. Newly submitted **claims 9-12 and 21** are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

7. The following Inventions have been identified in the present Application:

I. **Claims 1-6, 8, and 14-20**, drawn to a method of image processing comprising analyzing, deriving, and storing, classified in class 382, subclass 254.

II. **Claims 9-12 and 21**, drawn to a method of estimating tone background comprising generating edge-metrics, generating a first histogram, using the edge-metrics, and estimating, classified in class 382, subclass 199.

8. The inventions are distinct, each from the other because:

9. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination can use the largest peak in a color or luminance histogram of an image to derive background noise removal data. The subcombination has separate utility such as use with any image segmentation or object/feature recognition process.

10. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, **claims 9-12 and 21** are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Preliminary Matters

11. In order to present the singular best grounds of rejection, the Examiner is withdrawing the prior art rejections made under Karidi (WO 00/70863 A3) and Ball (U.S. Patent 6,323,957 B1) and maintaining the rejections under Nara (U.S. Publication 2002/0060819 A1). Thus, the arguments directed towards Karidi and Ball will not be addressed in this Action.

Response to Arguments

12. Applicant's arguments with respect to **claim 1** have been considered but are moot in view of the new ground(s) of rejection.

13. Applicant's arguments regarding the Nara rejection of **claim 15** in the third full paragraph on page 10 of the Amendment filed 05 April 2004 have been fully considered but they are not persuasive.

14. Applicants argue in substance that:

a. **Because background removal can be performed on the digital image before and after rendering, claim 15 should be allowable over Nara.**

The terms "can be" and "capable of" do not positively define a claim limitation in U.S. practice. Statute 35 USC 112, second paragraph, requires the applicant to particularly point out and distinctly claim the subject matter that he regards as the invention. Therefore, claims should define an invention by what it "is", and not by what it "can be" or is otherwise "capable of" doing. These terms, while not indefinite, do not positively define or further limit the invention. Therefore, in accordance with the plain

meaning of "can be" and "capable of", so long as a prior art reference "can" perform or is "capable of" performing the recited function (e.g. if properly adjusted, modified, or programmed), then the claim limitation is met by the reference.

In that light, it is perfectly conceivable to modify Nara to perform background removal before and after rendering. Nara already possesses the capacity to perform background removal prior to rendering (see the prior art rejection of claim 1, also Fig 4). Removal after rendering could be implemented, e.g. by running the image through the Fig 4 system once without background removal (thus, rendering once), and then running the resultant image through the Fig 4 system with the background removal (background removal then being performed after the first rendering).

15. None of the amendments to the remaining dependent claims were argued as a point of patentability.

Claim Objections

16. **Claim 15** is objected to because of the following informalities: Line 7 prematurely ends the claim with a period after "together". Appropriate correction is required.

Claim Rejections - 35 USC § 112

17. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

18. **Claims 1-6, 8, 14, and 16** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

19. In regards to **claim 1**, the limitation regarding "batch processing" in line 8 of the amended claim has not been expressly disclosed in the remainder of the specification. Consider referencing the section(s) of the specification that provide support for this limitation.

20. In regards to **claim 3**, the limitation regarding "sampled values of the tonemap function" in line 3 of the amended claim has not been expressly disclosed in the remainder of the specification. Consider referencing the section(s) of the specification that provide support of this limitation.

21. **Claims 2-6, 8, 14, and 16** inherit the language and do not compensate for the written description requirement of claims 1 and 3.

22. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

23. **Claims 1-6, 8, 14, and 16** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

24. **Claim 1** recites the limitation "the stored data" in line 8 of the claim. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether "the stored

data" refers back to "the entire image" on the previous line, "the background noise removal data" on the previous line, or both.

25. **Claims 2-6, 8, 14, and 16** inherit the indefinite limitation of claim 1 and do not compensate for the indefiniteness.

Claim Rejections - 35 USC § 102

26. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

27. As best understood in light of the claim objections, **claims 15 and 17-20** are rejected under 35 U.S.C. 102(e) as being anticipated by Nara (U.S. Publication 2002/0060819 A1, previously cited, "Nara").

28. In regards to **claim 15**, Nara discloses a system for processing a digital image (Fig 14) corresponding to a scanned document (paragraph 0075), the system comprising: statistical analyzer for analyzing the image (paragraph 0137, ref no 48 and 49) to obtain statistical data; function derivator for deriving background removal data (Fig 19(b) and paragraphs 0161 and 0164) for the image based on the statistical data; and data storage for storing the image (ref no 58, Fig 14) and the background removal data together (Fig 17); whereby background removal can be performed on the digital image before (paragraph 0158 in light of paragraph 0098) and after rendering.

Regarding Fig 17, paragraph 0146 discloses as shown in Fig 17, the threshold data Dth1 is attached to the image data Drd1, where Fig 4, ref no 58, is an image memory.

Also, the terms "can be" and "capable of" do not positively define a claim limitation in U.S. practice. Statute 35 USC 112, second paragraph, requires the applicant to particularly point out and distinctly claim the subject matter that he regards as the invention. Therefore, claims should define an invention by what it "is", and not by what it "can be" or is otherwise "capable of" doing. These terms, while not indefinite, do not positively define or further limit the invention. Therefore, in accordance with the plain meaning of "can be" and "capable of", so long as a prior art reference "can" perform or is "capable of" performing the recited function (e.g. if properly adjusted, modified, or programmed), then the claim limitation is met by the reference. In that light, it is perfectly conceivable to modify Nara to perform background removal before and after rendering. Nara already possesses the capacity to perform background removal prior to rendering (see the prior art rejection of claim 1, also Fig 4). Removal after rendering could be implemented, e.g. by running the image through the Fig 4 system once without background removal (thus, rendering once), and then running the resultant image through the Fig 4 system with the background removal (background removal then being performed after the first rendering).

29. In regards to **claim 17**, Nara further discloses in ref no 43, Fig 14, and paragraph 0085, the statistical analyzer pre-processing the image while analyzing the image and using intermediate results obtained from pre-processing the image to obtain the statistical data.

30. In regards to **claim 18**, Nara further discloses in Fig 19(b) and paragraphs 0161 and 0164, the background noise removal data including a tonemap function or sampled values of the tonemap function.

31. In regards to **claim 19**, Nara further discloses in paragraph 0170, the system further comprising a user interface for allowing viewing of a rendering of image data dependent on the user selection.

32. In regards to **claim 20**, Nara further discloses in paragraph 0171, the system further comprising a user interface including an option allowing the selection of background noise removal on a page-by-page basis.

Claim Rejections - 35 USC § 103

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

34. As best understood in light of the rejections under 35 USC 112, **claims 1-6, 8, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nara (U.S. Publication 2002/0060819 A1, previously cited, "Nara") in combination with Stolfo (U.S. Patent 5,668,897, newly cited, "Stolfo").

35. In regards to **claim 1**, Nara discloses a method of processing a digital image (Fig 14) corresponding to a scanned document (paragraph 0075), the method comprising: analyzing the image (paragraph 0137, ref no 48 and 49) to obtain statistical data; deriving background noise

removal data (Fig 19(b) and paragraphs 0161 and 0164) for the entire image based on the statistical data; storing the entire image (ref no 58, Fig 14) and the background noise removal data (Fig 17); and providing user selection (paragraph 0158 in light of paragraph 0098) to: in a first case, use the stored image and the stored data to remove background noise from the image prior to rendering the image; and in a second case, to bypass background noise removal in the stored image prior to rendering.

Regarding Fig 17, paragraph 0146 discloses as shown in Fig 17, the threshold data Dth1 is attached to the image data Drd1, where Fig 4, ref no 58, is an image memory.

Nara does not expressly disclose the stored data available for batch processing.

Stolfo teaches in col 22, lines 57-50, stored data available for batch processing.

Nara and Stolfo are combinable because they are from the art of image background removal.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Stolfo's teachings into Nara's method.

The suggestion/motivation would have been to operate the system at peak speed where finite delays in information access and processing occur after the entire image is scanned (Stolfo, col 21, line 33).

Therefore, it would have been obvious to combine Nara and Stolfo to obtain the invention as specified.

36. In regards to **claim 2**, all the additional limitations have been addressed in the argument of claim 17.

37. In regards to **claim 3**, Nara further discloses in Fig 19(b) and paragraphs 0161 and 0164, the background noise removal data including a tonemap function or sampled values of the tonemap function.

38. In regards to **claim 4**, Nara further discloses in Fig 17 and paragraph 0146, the image and the background noise removal data being stored together.

39. In regards to **claim 5**, Nara further discloses in paragraph 0137, the method wherein analyzing the image further comprising estimating a global background tone value.

40. In regards to **claim 6**, Nara further discloses in paragraph 0152, the background noise removal data being derived from the global background tone value.

41. In regards to **claim 8**, Nara further discloses in paragraph 0171, the method further comprising providing a user interface including an option allowing the selection of background noise removal on a page-by-page basis.

42. In regards to **claim 16**, Nara further discloses in Fig 4, ref no 46, the statistical data and the background noise removal data being obtained in real time, as the document is being scanned. Note that ref no 46 is prior to ref no 58, image memory.

43. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nara (U.S. Publication 2002/0060819 A1) and Stolfo (U.S. Patent 5,668,897) as applied to claim 1, in further combination with Matsugu (U.S. Patent 6,636,635 B2) and Ito (U.S. Patent 6,144,763).

44. In regards to **claim 14**, Nara and Stolfo do not expressly disclose the statistical data is obtained from the luminance channel.

However, Nara discloses in paragraph 0087 using one peak of the image data to detect a document background level with sufficient accuracy.

Matsugu teaches in col 30, lines 29-32, obtaining statistical data from the luminance channel.

Matsugu and Nara and Stolfo are combinable because they are from the art of threshold setting.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Matsugu's luminance as Nara and Stolfo's one peak.

The suggestion/motivation would have been to use the most discriminant feature (luminance) to isolate the background from a document image.

Therefore, it would have been obvious to combine Matsugu with Nara and Stolfo.

Nara, Stolfo, and Matsugu do not expressly disclose the image being color-converted to a luminance-chrominance color space prior to obtaining the statistical data.

However, Nara discloses the image input from a CCD (Fig 4, ref no 13) and Matsugu discloses using luminance to determine thresholds (col 30, lines 29-32).

Ito teaches in col 4, lines 55-59, the image being color-converted to a luminance-chrominance color space prior to obtaining statistical data.

Ito and Nara, Stolfo and Matsugu are combinable because they are from the art of CCD image pre-processing.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Ito's color conversion into Nara, Stolfo, and Matsugu's method.

The suggestion/motivation would have been to properly convert the RGB CCD input into luminance values for processing. An additional benefit would have been to reduce the data representing the image for easier storage.

Therefore, it would have been obvious to combine Ito with Nara, Stolfo, and Matsugu to obtain the invention as specified.

Conclusion

45. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher T. Sukhaphadhana whose telephone number is (703) 306-4148. The examiner can normally be reached on 9a-5p M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CTS

CTS

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600